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ORIGINAL ARTICLE

Association between periodontal diseases and systemic illnesses: A survey among internal medicine residents in Nigeria

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Abstract *Objective:* To assess internal medicine residents' knowledge of associations between periodontal disease and systemic illnesses, and attitudes toward patients' periodontal health.

Methods: A cross-sectional survey using a self-administered questionnaire was conducted among internal medicine residents attending the Faculty of Internal Medicine 2014 Update Course organized by the National Postgraduate Medical College of Nigeria. Participants came from all over the country. Data on respondents' demographic characteristics, periodontal disease knowledge, knowledge of associations between periodontal disease and systemic illnesses, and attitudes toward patients' periodontal health were collected. Data were analyzed using Epi INFO software. The Pearson chi square test was used to measure significant association between categorical variables such as the knowledge of periodontal disease and gender, age group and designation of the participants ($p \leqslant 0.05$).

Results: Of 150 questionnaires distributed, 123 were returned (82% response rate); 109 questionnaires were completed properly and included in the analysis. The most common source of residents' information on oral health was television (59.4%). Only 11.2% of respondents were aware that

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Peer review under responsibility of King Saud University.

gingival bleeding was the earliest sign of periodontal disease. Respondents correctly identified periodontal disease as a risk factor for coronary heart disease (45.9%), stroke (43.5%), hospital-acquired pneumonia (53.2%), diabetes mellitus (13.8%), and preterm birth (11%). Increased age ($p = 0.032$) and male gender ($p = 0.022$) were associated significantly with knowledge of periodontal disease as a risk factor for stroke. Higher designation ($p = 0.002$) and longer duration in residency training ($p = 0.004$) were associated significantly with knowledge of periodontal disease as risk factor for peripheral arterial disease. The majority (90.9%) of respondents had positive attitudes toward the referral of their patients for regular periodontal care.

Conclusions: Knowledge of periodontal disease as a risk factor for systemic illnesses among medical residents in Nigeria is inadequate. These relationships should be emphasized in continuing medical education courses.

1. Introduction

Periodontal disease is highly prevalent, contributing to the global burden of chronic diseases and constituting a major public health problem (Petersen and Baehni, 2012; Petersen and Ogawa, 2012). The importance of oral health, of which periodontal health is a key component, to general well-being has been well documented (USDHHS, 2000). Most periodontal diseases are inflammatory in nature and are initiated by plaque biofilm, resulting in gingivitis. When untreated, this mild form of the disease may progress to periodontitis and tooth loss (Petersen and Ogawa, 2012). The earliest sign of gingivitis is bleeding from the gingiva, especially during tooth brushing. Periodontal disease can be readily reversed by effective plaque control measures, such as daily tooth brushing and the use of interdental cleaning aids (e.g., dental floss) (Darby and Walsh, 2010).

Bilateral associations between periodontitis and a wide range of systemic conditions, such as cardiovascular disease (Demmer and Desvarieux, 2006), diabetes mellitus (Mealey, 2006), and poor pregnancy outcomes (Scannapieco et al., 2003), have been reported. Periodontitis may be a source of systemic inflammation that impacts overall health (Quijano et al., 2010). The successful prevention and management of periodontal disease depend to a large extent on awareness and good knowledge of its causes, early identification of symptoms, and effective treatment (Zhu et al., 2005).

In Nigeria, the level of awareness of oral diseases in the general population has been documented as being low (Sofola, 2010). This situation may have serious consequences for patients with medical problems and oral issues, such as periodontal disease. Given the grossly inadequate dentist-to-population ratio in Nigeria (Sofola, 2010), patients are more likely to seek oral health care from medical professionals than from dentists. Similar situations have been documented in other countries (Cohen and Manski, 2006; Cohen et al., 2008).

Hence, medical doctors, especially physicians, must be well informed about periodontal disease and its bilateral associations with systemic conditions to ensure best practices in patient care. Previous studies have shown varying levels of awareness among doctors (Weidlich et al., 2008; Gur and Majra, 2011; Nagarakanti et al., 2013; Nasir et al., 2013), with limited awareness in developing countries like Nigeria (Gur and Majra, 2011; Nasir et al., 2013). A few studies have shown reduced awareness and poor referral practices among physicians in Nigeria (Sofola and Ayankogbe, 2009; Opeodu et al., 2014). The aim of this study was to assess the knowledge of periodontal disease, its associations with systemic conditions, and professional attitudes toward periodontal health among internal medicine residents from health institutions across Nigeria.

2. Methods

This cross-sectional survey was conducted among internal medicine residents from several residency training institutions in Nigeria attending the Faculty of Internal Medicine 2014 Update Course, organized by the National Postgraduate Medical College of Nigeria. All resident doctors attending the course were invited to participate in the study. Self-administered questionnaires were distributed to consecutive consenting resident doctors during their break times and retrieved thereafter.

The questionnaire consisted of three sections. Section A solicited information on respondents' demographic characteristics, training institution, geopolitical zone in which the residency training institution is located, number of years since graduation from medical school, number of years in the residency training program (This refers to the number of years the participants have spent in the residency training program in their various institutions), and sources of information on oral health.

Section B assessed respondents' knowledge of periodontal disease, including the meaning of the term "periodontal diseases," their primary cause, earliest symptom/sign, and best prevention method. The knowledge of the bidirectional relationships between periodontal disease and different systemic conditions and medications was also assessed. This subsection assessed respondents' knowledge of the effects of some systemic illnesses on periodontal disease, as well as the knowledge of periodontal disease as a risk factor for some systemic illnesses. The scoring criteria for the four questions assessing the knowledge of periodontal disease were based on score 1 for each correct response, and score 0 for wrong answers. This gave a score range of 0–4 which was then dichotomized into 0–2 (inadequate) and 3–4 (adequate) levels of knowledge about periodontal disease. The subsections on periodontal disease and systemic illnesses/medications had "yes," "no," and "not sure" response options.